

SECTION V-B - FM BROADCAST ENGINEERING DATA (Page 3)

10. Is a directional antenna proposed?

 Yes No

If Yes, attach as an Exhibit a statement with all data specified in 47 C.F.R. Section 73.316, including plot(s) and tabulations of the relative field.

Exhibit No.
E-2

11. Will the proposed facility satisfy the requirements of 47 C.F.R. Sections 73.315(a) and (b)?

 Yes No

If No, attach as an Exhibit a request for waiver and justification therefor, including amounts and percentages of population and area that will not receive 3.16 mV/m service.

Exhibit No.
N/A

12. Will the main studio be within the protected 3.16 mV/m field strength contour of this proposal?

 Yes No

If No, attach as an Exhibit justification pursuant to 47 C.F.R. Section 73.1125.

Exhibit No.
N/A

13. (a) Does the proposed facility satisfy the requirements of 47 C.F.R. Section 73.207?

 Yes No

(b) If the answer to (a) is No, does 47 C.F.R. Section 73.213 apply?

 Yes No

(c) If the answer to (b) is Yes, attach as an Exhibit a justification, including a summary of previous waivers.

Exhibit No.
E-2

(d) If the answer to (a) is No and the answer to (b) is No, attach as an Exhibit a statement describing the short spacing(s) and how it or they arose.

Exhibit No.
N/A

(e) If authorization pursuant to 47 C.F.R. Section 73.215 is requested, attach as an Exhibit a complete engineering study to establish the lack of prohibited overlap of contours involving affected stations. The engineering study must include the following:

Exhibit No.
E-2

- (1) Protected and interfering contours, in all directions (360°), for the proposed operation.
- (2) Protected and interfering contours, over pertinent arcs, of all short-spaced assignments, applications and allotments, including a plot showing each transmitter location, with identifying call letters or file numbers, and indication of whether facility is operating or proposed. For vacant allotments, use the reference coordinates as the transmitter location.
- (3) When necessary to show more detail, an additional allocation study utilizing a map with a larger scale to clearly show prohibited overlap will not occur.
- (4) A scale of kilometers and properly labeled longitude and latitude lines, shown across the entire exhibit(s). Sufficient lines should be shown so that the location of the sites may be verified.
- (5) The official title(s) of the map(s) used in the exhibits(s).

14. Are there: (a) within 60 meters of the proposed antenna, any proposed or authorized FM or TV transmitters, or any nonbroadcast *(except citizens band or amateur)* radio stations; or (b) within the blanketing contour, any established commercial or government receiving stations, cable head-end facilities, or populated areas; or (c) within ten (10) kilometers of the proposed antenna, any proposed or authorized FM or TV transmitters which may produce receiver-induced intermodulation interference?

 Yes No

If Yes attach as an Exhibit a description of any expected, undesired effects of operations and remedial steps to be pursued if necessary, and a statement accepting full responsibility for the elimination of any objectionable interference (including that caused by receiver-induced or other types of modulation) to facilities in existence or authorized or to radio receivers in use prior to grant of this application. (See 47 C.F.R. Sections 73.315(b), 73.316(e) and 73.318.)

Exhibit No.
E-2

15. Attach as an Exhibit a 7.5 minute series U.S. Geological Survey topographic quadrangle map that shows clearly, legibly, and accurately, the location of the proposed transmitting antenna. This map must comply with the requirements set forth in Instruction V (D). The map must further clearly and legibly display the original printed contour lines and data as well as latitude and longitude markings, and must bear a scale of distance in kilometers.

Exhibit No.
E-2

16. Attach as an Exhibit (*name the source*) a map which shows clearly, legibly, and accurately, and with the original printed latitude and longitude markings and a scale of distance in kilometers:

Exhibit No.
E-2

- (a) the proposed transmitter location, and the radials along which profile graphs have been prepared;
- (b) the 3.16 mV/m and 1 mV/m predicted contours; and
- (c) the legal boundaries of the principal community to be served.

17. Specify area in square kilometers (1 sq. mi. = 259 sq. km.) and population (latest census) within the predicted 1 mV/m contour.

Area 2030 sq. km. Population 565,555

18. For an application involving an auxiliary facility only, attach as an Exhibit a map (*Sectional Aeronautical Chart or equivalent*) that shows clearly, legibly, and accurately, and with latitude and longitude markings and a scale of distance in kilometers:

Exhibit No.
N/A

- (a) the proposed auxiliary 1 mV/m contour; and
- (b) the 1 mV/m contour of the licensed main facility for which the applied-for facility will be auxiliary. Also specify the file number of the license.

19. Terrain and coverage data (*to be calculated in accordance with 47 C.F.R. Section 73.313*)

Source of terrain data: (*check only one box below*)

Linearly interpolated 30-second database 7.5 minute topographic map

(Source: NGDC)

Other (*briefly summarize*)

Radial bearing (degrees True)	Height of radiation center above average elevation of radial from 8 to 16 km (meters)	Predicted Distances	
		To the 8.16 mV/m contour (kilometers)	To the 1 mV/m contour (kilometers)
*			
0	98	13.3	24.0
45	82	14.5	25.8
90	69	13.3	23.9
135	85	13.1	23.6
180	133	10.8	19.6
225	120	14.9	26.5
270	111	17.2	29.7
315	105	15.5	27.4

*Radial through principal community, if not one of the major radials. This radial should NOT be included in the calculation of HAAT.

1. Environmental Statement (See 47 C.F.R. Section 1.1301 et seq.)

Would a Commission grant of this application come within Section 1.1307 of the FCC Rules, such Yes No that it may have a significant environmental impact?

If you answer Yes, submit as an Exhibit an Environmental Assessment required by Section 1.1311.

Exhibit No.
N/A

If No, explain briefly why not

Categorically excluded by Section 1.1306 of the FCC Rules.

CERTIFICATION

I certify that I have prepared this Section of this application on behalf of the applicant, and that after such preparation, I have examined the foregoing and found it to be accurate and true to the best of my knowledge and belief.

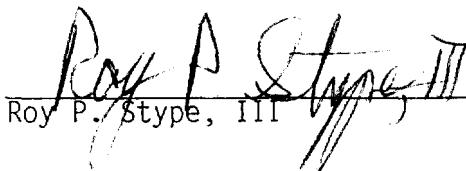
Name (typed or printed)	Relationship to Applicant (e.g., Consulting Engineer)	
Roy P. Stype, III	Consulting Engineer	
Signature	Address (Include ZIP Code)	
	2324 N. Cleveland-Massillon Road Bath, OH 44210	
Date	Telephone No. (Include Area Code)	
5/3/94	(216) 659-4440	

ENGINEERING AFFIDAVIT

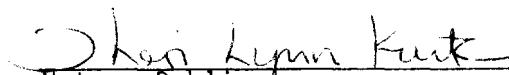
State of Ohio)
)
County of Summit)

Roy P. Stype, III, being duly sworn, deposes and states that he is a graduate Electrical Engineer, a qualified and experienced Communications Consulting Engineer whose works are a matter of record with the Federal Communications Commission and that he is a member of the Firm of "Carl E. Smith Consulting Engineers" located at 2324 North Cleveland-Massillon Road in the Township of Bath, County of Summit, State of Ohio, and that the Firm has been retained by David A. Ringer to prepare the attached "Engineering Exhibit E-2."

The deponent states that the Exhibit was prepared by him or under his direction and is true of his own knowledge, except as to statements made on information and belief and as to such statements, he believes them to be true.


Roy P. Stype, III

Subscribed and sworn to before me this 3rd day of May, 1994.


Sheri Lynn Kurtz
Notary Public

SHERI LYNN KURTZ, Notary Public
For the State of Ohio
My Commission Expires June 14, 1995
Recorded in Summit County

/SEAL/

ENGINEERING STATEMENT

1.0 GENERAL

This engineering exhibit is prepared on behalf of David A. Ringer, applicant (BPH-911230MA) for a construction permit for a new FM station on Channel 280A in Westerville, Ohio. It supports an amendment to the above referenced application to specify a new transmitter site and slightly different operating facilities. This amendment was made necessary due to the loss of the availability of the tower site originally specified in the above referenced application.

The attached amendment proposes operation with a maximum effective radiated power of 6 kilowatts, utilizing a directional antenna, at 100 meters above average terrain, the maximum facilities permitted for a Class A station. Canadian concurrence has been obtained for 6 kilowatt operation on this channel. Thus, the facilities proposed in the attached amendment fully comply with all international agreements.

The proposed facilities will be short spaced to WTTF-FM - Tiffin, Ohio, and WPAY-FM - Portsmouth, Ohio. Section 2.0 of this exhibit contains a complete discussion of this situation, as well as allocation considerations to all other facilities requiring protection consideration.

The tower upon which the proposed antenna will be mounted is also authorized to support antennas for several other stations:

WTTE(TV)	Columbus, OH	Channel 28
WOSU-TV	Columbus, OH	Channel 34
W15AU(CP)	Columbus, OH	Channel 15
W41BB(CP)	Columbus, OH	Channel 41
W62BE(Lic. & CP)	Columbus, OH	Channel 62

Equation (4), found on Page 8 of FCC OST Bulletin No. 65, details the calculation technique for determining the worst case far field equivalent power density for FM stations. Likewise, Equation (5), found on

Page 13 of this same document, details the calculation technique for TV broadcast stations. Utilizing these equations and assuming 100% downward radiation for all stations, Table 1.0 summarizes the predicted power densities at 2 meters above ground level for all of these stations. As shown by this data, the proposed facilities, in conjunction with these other stations, will not result in power densities at 2 meters above ground level exceeding the values permitted by ANSI Standard C95.1 - 1982. Should it be necessary for workers to climb this tower, the proposed facility will, in conjunction with the other stations on this tower, cease operation or operate in such a mode that these workers will not be exposed to total power densities exceeding the permitted level.

TABLE 1.0
POWER DENSITY CALCULATIONS
(TOWER BASE)

David A. Ringer
Westerville, OH

<u>Station</u>	<u>Channel</u>	<u>Effective Radiated Power (kW)</u>	<u>Antenna Height (m AGL)</u>	<u>Calculated Power Density ($\mu\text{W}/\text{cm}^2$)</u>	<u>Permitted Power Density ($\mu\text{W}/\text{cm}^2$)</u>	<u>Percent of Limit</u>
Proposed FM	280A	6.0(CP)	102	40.1	1000	4.01
WTTE(TV)	28	1910	300	359.3	1847	19.45
WOSU-TV	34	1170	331	180.6	1967	9.18
W15AU(CP)	15	15.0	74	48.3	1587	3.05
W41BB(CP)	41	17.2	74	55.4	2107	2.63
W62BE(Lic.)	62	9.8	106	15.1	2527	0.60
W62BE(CP)	62	38.3	78	110.8	<u>2527</u>	<u>4.38</u>

Total Calculated Power Density = 42.70%*

*Includes W62BE construction permit facilities, but not W62BE licensed facilities, for worst case analysis.

2.0 ALLOCATION CONSIDERATIONS

Channel 280 is allotted to Westerville, Ohio, in Section 73.202(b) of the FCC Rules as a Class A facility. Table 2.0 is an FM allocation study showing the actual and required separations between the facilities proposed herein and any applicable existing or proposed stations or allotments.

As shown in this table, the facilities proposed herein would be short spaced to two other stations:

WTTF-FM	Tiffin, OH	Channel 279B
WPAY-FM	Portsmouth, OH	Channel 281C

These short spacings are permitted under Section 73.215 of the FCC Rules, provided that the necessary contour protection is provided to these short spaced stations. The spacings to both of these stations comply with the requirements of Section 73.215(e) of the FCC Rules which specifies the minimum spacing which must be maintained when employing contour protection.

As outlined in Section 73.215 of the FCC Rules, to provide the required contour protection to WTTF-FM, there can be no overlap between the WTTF-FM 54 dBu 50% contour and the proposed 48 dBu 10% contour or between the proposed 60 dBu 50% contour and the WTTF-FM 54 dBu 10% contour. Likewise, to provide the required contour protection to WPAY-FM, there can be no overlap between the WPAY-FM 60 dBu 50% contour and the proposed 54 dBu 10% contour or between the proposed 60 dBu 50% contour and the WPAY-FM 54 dBu 10% contour. As outlined in Section 73.215(b) of the FCC Rules, the contour projections for WTTF-FM assume operation with an omnidirectional effective radiated power of 50 kilowatts at 150 meters above average terrain, the maximum facilities permitted for a Class B station. Those for WPAY-FM assume operation with an omnidirectional

effective radiated power of 100 kilowatts at 600 meters above average terrain, the maximum facilities permitted for a Class C station. Terrain data from the NGDC 30 second terrain database was utilized in projecting these contours. Tables 2.1(a) and 2.1(b) present the projections of the appropriate contours for WPAY-FM, assuming an antenna height of 822 meters above sea level. Likewise, Tables 2.2(a) and 2.2(b) present the projections of the appropriate contours for WTTF-FM, assuming an antenna height of 383 meters above sea level. Tables 2.3(a) through 2.3(c) present the projections of the appropriate contours for the facilities proposed herein. These contours are based upon the actual proposed operating facilities, including the directional antenna pattern detailed in Section 3.0 of this exhibit, and terrain data from the NGDC 30 second terrain database. Figure 2.0 shows all of these contours on an appropriate map base. As can be seen from an examination of this figure, the proposed operating facilities provide the required contour protection to WPAY-FM, and thus fully comply with Section 73.215 of the FCC Rules with regard to WPAY-FM.

This figure also shows that a small amount of overlap will occur between the proposed 48 dBu 10% contour and the 54 dBu 50% contour of WTTF-FM. The reference coordinates for the Westerville allotment fail to comply with the spacing requirements of Section 73.207 of the FCC Rules with regard to WTTF-FM. Accordingly, applicants for this channel are permitted to invoke the provisions of Section 73.213(c) of the FCC Rules with regard to WTTF-FM. This Rule Section permits operation with an effective radiated power of 3 kilowatts at 100 meters above average terrain, or equivalent, provided the spacing to WTTF-FM exceeds the 105 kilometer value specified in Section 73.213(c)(1) of the FCC Rules. As shown in Table 2.0, the proposed spacing to WTTF-FM is 112.18 kilometers. Further-

more, over the arc where the overlap with WTTF-FM will occur, the proposed directional pattern will limit the radiation to 3 kilowatts. Thus, this proposed overlap should pose no impediment to the grant of the attached application, since the proposed facilities fully protect WTTF-FM pursuant to Section 73.213(c) of the FCC Rules.

The proposed facility fully complies with the spacing requirements of Section 73.207 of the FCC Rules with regard to all other stations requiring protection consideration.

TABLE 2.0

FM ALLOCATION STUDY - CHANNEL 280A (103.9 MHz) - WESTERVILLE, OH

DAVID A. RINGER
WESTERVILLE, OH

STUDY COORDINATES: 40/09/33 82/55/21

STATION	LOCATION	CHANNEL	CLASS	SPACING (km)	REQUIRED SPACING* (km)	NOTES
90-318	Forest, OH	226	A	94.57	10.0	7
WKKJ	Reynoldsburg, OH	227	B	31.45	15.0	7
WKKJ	Chillicothe, OH	227	B	65.03	15.0	3, 6
WKKJ	Chillicothe, OH	227	B	92.16	15.0	3
90-318	New Washington, OH	227	A	98.00	10.0	7
BPH930219MG	St. Marys, OH	277	A	125.64	31.0	6
WCRF	Cleveland, OH	277	B	165.46	69.0	
WSWZ	Lancaster, OH	278	A	54.99	31.0	1
WTFFM	Tiffin, OH	279	B	112.18	113.0	9
WYMJFM	Beavercreek, OH	280	A	115.46	115.0	
WNMR	New Martinsville, WV	280	A	182.76	115.0	
WLEN	Adrian, MI	280	A	213.35	115.0	
WPAYFM	Portsmouth, OH	281	C	159.68	165.0	9
WQAL	Cleveland, OH	281	B	169.30	113.0	
WLBCFM	Muncie, IN	281	B	209.23	113.0	
BPH920113MC	Richwood, OH	282	A	36.62	31.0	2
WQKT	Wooster, OH	283	B	111.29	69.0	

* Required Spacing Per Section 73.207 of The FCC Rules

Notes:

- | | |
|--------------------------------------|-------------------------|
| 1 - Applied For Under Section 73.215 | 6 - Pending Application |
| 2 - Construction Permit | 7 - Proposed Rulemaking |
| 3 - Channel Deletion Proposed | 8 - Rulemaking Petition |
| 4 - Move From This Channel Ordered | 9 - Short-Spaced |
| 5 - Move to This Channel Ordered | 10 - Vacant Allotment |

WPAY-FM
60.0 dBu CONTOUR
(FM(50,50) Curves Utilized)

BEARING (Degrees)	AVERAGE TERRAIN (meters)	ANTENNA HAAT (meters)	HORIZONTAL ERP		DISTANCE TO CONTOUR (km)
			(dBk)	(kW)	
0.0 *	156.5	665.5	20.00	100.000	94.3
10.0	182.3	639.7	20.00	100.000	93.3
20.0	268.1	553.9	20.00	100.000	89.8
30.0	246.9	575.1	20.00	100.000	90.8
40.0	239.3	582.7	20.00	100.000	91.1
45.0 *	241.8	580.2	20.00	100.000	91.0
50.0	228.2	593.8	20.00	100.000	91.6
60.0	180.1	641.9	20.00	100.000	93.4
70.0	160.9	661.1	20.00	100.000	94.1
80.0	170.4	651.6	20.00	100.000	93.8
90.0 *	183.2	638.8	20.00	100.000	93.3
100.0	186.0	636.0	20.00	100.000	93.2
110.0	187.6	634.4	20.00	100.000	93.1
120.0	183.6	638.4	20.00	100.000	93.3
130.0	193.3	628.7	20.00	100.000	92.9
135.0 *	204.4	617.6	20.00	100.000	92.5
140.0	220.4	601.6	20.00	100.000	91.9
150.0	228.3	593.7	20.00	100.000	91.6
160.0	221.8	600.2	20.00	100.000	91.8
170.0	256.1	565.9	20.00	100.000	90.4
180.0 *	255.0	567.0	20.00	100.000	90.5
190.0	265.8	556.2	20.00	100.000	90.0
200.0	292.7	529.3	20.00	100.000	88.5
210.0	280.9	541.1	20.00	100.000	89.2
220.0	239.8	582.2	20.00	100.000	91.1
225.0 *	228.3	593.7	20.00	100.000	91.6
230.0	173.7	648.3	20.00	100.000	93.7
240.0	166.6	655.4	20.00	100.000	93.9
250.0	198.7	623.3	20.00	100.000	92.7
260.0	205.9	616.1	20.00	100.000	92.4
270.0 *	232.4	589.6	20.00	100.000	91.4
280.0	265.0	557.0	20.00	100.000	90.0
290.0	278.7	543.3	20.00	100.000	89.3
300.0	273.3	548.7	20.00	100.000	89.6
310.0	260.3	561.7	20.00	100.000	90.2
315.0 *	248.0	574.0	20.00	100.000	90.8
320.0	247.3	574.7	20.00	100.000	90.8
330.0	208.5	613.5	20.00	100.000	92.3
340.0	210.6	611.4	20.00	100.000	92.2
350.0	190.3	631.7	20.00	100.000	93.0

AVERAGE(*) = 218.7 meters

TABLE 2.1(a)

PREDICTED WPAY-FM
60 dBu 50% CONTOUR

David A. Ringer
Westerville, OH

WPAY-FM
54.0 dBu CONTOUR
(FM(50, 10) Curves Utilized)

BEARING (Degrees)	AVERAGE TERRAIN (meters)	ANTENNA HAAT (meters)	HORIZONTAL ERP (dBk)	DISTANCE TO CONTOUR (km)
0.0 *	156.5	665.5	20.00	100.000
10.0	182.3	639.7	20.00	100.000
20.0	268.1	553.9	20.00	100.000
30.0	246.9	575.1	20.00	100.000
40.0	239.3	582.7	20.00	100.000
45.0 *	241.8	580.2	20.00	100.000
50.0	228.2	593.8	20.00	100.000
60.0	180.1	641.9	20.00	100.000
70.0	160.9	661.1	20.00	100.000
80.0	170.4	651.6	20.00	100.000
90.0 *	183.2	638.8	20.00	100.000
100.0	186.0	636.0	20.00	100.000
110.0	187.6	634.4	20.00	100.000
120.0	183.6	638.4	20.00	100.000
130.0	193.3	628.7	20.00	100.000
135.0 *	204.4	617.6	20.00	100.000
140.0	220.4	601.6	20.00	100.000
150.0	228.3	593.7	20.00	100.000
160.0	221.8	600.2	20.00	100.000
170.0	256.1	565.9	20.00	100.000
180.0 *	255.0	567.0	20.00	100.000
190.0	265.8	556.2	20.00	100.000
200.0	292.7	529.3	20.00	100.000
210.0	280.9	541.1	20.00	100.000
220.0	239.8	582.2	20.00	100.000
225.0 *	228.3	593.7	20.00	100.000
230.0	173.7	648.3	20.00	100.000
240.0	166.6	655.4	20.00	100.000
250.0	198.7	623.3	20.00	100.000
260.0	205.9	616.1	20.00	100.000
270.0 *	232.4	589.6	20.00	100.000
280.0	265.0	557.0	20.00	100.000
290.0	278.7	543.3	20.00	100.000
300.0	273.3	548.7	20.00	100.000
310.0	260.3	561.7	20.00	100.000
315.0 *	248.0	574.0	20.00	100.000
320.0	247.3	574.7	20.00	100.000
330.0	208.5	613.5	20.00	100.000
340.0	210.6	611.4	20.00	100.000
350.0	190.3	631.7	20.00	100.000

AVERAGE(*) = 218.7 meters

TABLE 2.1(b)

PREDICTED WPAY-FM
54 dBu 10% CONTOUR

David A. Ringer
Westerville, OH

WTTF-FM
54.0 dBu CONTOUR
(FM(50,50) Curves Utilized)

BEARING (Degrees)	AVERAGE		HORIZONTAL		DISTANCE TO CONTOUR (km)
	TERRAIN (meters)	ANTENNA HAAT (meters)	ERP (dBk)	(kW)	
0.0 *	216.3	166.7	16.99	50.000	67.1
10.0	213.3	169.7	16.99	50.000	67.5
20.0	209.1	173.9	16.99	50.000	67.9
30.0	207.2	175.8	16.99	50.000	68.1
40.0	206.7	176.3	16.99	50.000	68.2
45.0 *	206.6	176.4	16.99	50.000	68.2
50.0	208.3	174.7	16.99	50.000	68.0
60.0	213.7	169.3	16.99	50.000	67.4
70.0	217.4	165.6	16.99	50.000	67.0
80.0	223.7	159.3	16.99	50.000	66.3
90.0 *	230.0	153.0	16.99	50.000	65.5
100.0	233.2	149.8	16.99	50.000	65.0
110.0	235.5	147.5	16.99	50.000	64.7
120.0	236.0	147.0	16.99	50.000	64.6
130.0	236.6	146.4	16.99	50.000	64.6
135.0 *	234.9	148.1	16.99	50.000	64.8
140.0	233.7	149.3	16.99	50.000	65.0
150.0	232.7	150.3	16.99	50.000	65.1
160.0	233.8	149.2	16.99	50.000	65.0
170.0	241.6	141.4	16.99	50.000	63.9
180.0 *	242.3	140.7	16.99	50.000	63.8
190.0	242.0	141.0	16.99	50.000	63.8
200.0	242.9	140.1	16.99	50.000	63.7
210.0	243.9	139.1	16.99	50.000	63.5
220.0	243.6	139.4	16.99	50.000	63.6
225.0 *	242.9	140.1	16.99	50.000	63.7
230.0	240.5	142.5	16.99	50.000	64.0
240.0	239.1	143.9	16.99	50.000	64.2
250.0	236.5	146.5	16.99	50.000	64.6
260.0	231.2	151.8	16.99	50.000	65.3
270.0 *	226.1	156.9	16.99	50.000	66.0
280.0	225.6	157.4	16.99	50.000	66.0
290.0	225.6	157.4	16.99	50.000	66.0
300.0	224.8	158.2	16.99	50.000	66.1
310.0	224.2	158.8	16.99	50.000	66.2
315.0 *	219.9	163.1	16.99	50.000	66.7
320.0	217.3	165.7	16.99	50.000	67.0
330.0	216.4	166.6	16.99	50.000	67.1
340.0	216.6	166.4	16.99	50.000	67.1
350.0	215.7	167.3	16.99	50.000	67.2

AVERAGE(*) = 227.4 meters

TABLE 2.2(a)

PREDICTED WTTF-FM
54 dBu 50% CONTOUR

David A. Ringer
Westerville, OH

WTTF-FM
54.0 dBu CONTOUR
(FM(50,10) Curves Utilized)

BEARING (Degrees)	AVERAGE TERRAIN (meters)	ANTENNA HAAT (meters)	HORIZONTAL ERP (dBk)	DISTANCE TO CONTOUR (km)
0.0 *	216.3	166.7	16.99	50.000 80.5
10.0	213.3	169.7	16.99	50.000 80.9
20.0	209.1	173.9	16.99	50.000 81.5
30.0	207.2	175.8	16.99	50.000 81.7
40.0	206.7	176.3	16.99	50.000 81.8
45.0 *	206.6	176.4	16.99	50.000 81.8
50.0	208.3	174.7	16.99	50.000 81.6
60.0	213.7	169.3	16.99	50.000 80.9
70.0	217.4	165.6	16.99	50.000 80.3
80.0	223.7	159.3	16.99	50.000 79.5
90.0 *	230.0	153.0	16.99	50.000 78.6
100.0	233.2	149.8	16.99	50.000 78.1
110.0	235.5	147.5	16.99	50.000 77.7
120.0	236.0	147.0	16.99	50.000 77.7
130.0	236.6	146.4	16.99	50.000 77.6
135.0 *	234.9	148.1	16.99	50.000 77.8
140.0	233.7	149.3	16.99	50.000 78.0
150.0	232.7	150.3	16.99	50.000 78.2
160.0	233.8	149.2	16.99	50.000 78.0
170.0	241.6	141.4	16.99	50.000 76.8
180.0 *	242.3	140.7	16.99	50.000 76.7
190.0	242.0	141.0	16.99	50.000 76.7
200.0	242.9	140.1	16.99	50.000 76.6
210.0	243.9	139.1	16.99	50.000 76.4
220.0	243.6	139.4	16.99	50.000 76.5
225.0 *	242.9	140.1	16.99	50.000 76.6
230.0	240.5	142.5	16.99	50.000 77.0
240.0	239.1	143.9	16.99	50.000 77.2
250.0	236.5	146.5	16.99	50.000 77.6
260.0	231.2	151.8	16.99	50.000 78.4
270.0 *	226.1	156.9	16.99	50.000 79.1
280.0	225.6	157.4	16.99	50.000 79.2
290.0	225.6	157.4	16.99	50.000 79.2
300.0	224.8	158.2	16.99	50.000 79.3
310.0	224.2	158.8	16.99	50.000 79.4
315.0 *	219.9	163.1	16.99	50.000 80.0
320.0	217.3	165.7	16.99	50.000 80.4
330.0	216.4	166.6	16.99	50.000 80.5
340.0	216.6	166.4	16.99	50.000 80.5
350.0	215.7	167.3	16.99	50.000 80.6

AVERAGE(*) = 227.4 meters

TABLE 2.2(b)

PREDICTED WTTF-FM
54 dBu 10% CONTOUR

David A. Ringer
Westerville, OH

PROPOSED
60.0 dBu CONTOUR
(FM(50,50) Curves Utilized)

BEARING (Degrees)	AVERAGE TERRAIN (meters)	ANTENNA HAAT (meters)	----- HORIZONTAL -----			DISTANCE TO CONTOUR (km)
			RELATIVE	FIELD (dBk)	ERP (kW)	
0.0 *	285.3	97.7	0.707	4.77	2.999	24.0
5.0	286.2	96.8	0.707	4.77	2.999	23.8
10.0	288.1	94.9	0.790	5.73	3.745	24.8
20.0	287.5	95.5	0.990	7.69	5.881	27.6
30.0	291.9	91.1	1.000	7.78	6.000	27.1
40.0	297.6	85.4	1.000	7.78	6.000	26.3
45.0 *	300.8	82.2	1.000	7.78	6.000	25.8
50.0	303.9	79.1	1.000	7.78	6.000	25.3
60.0	306.3	76.7	1.000	7.78	6.000	25.0
70.0	308.0	75.0	1.000	7.78	6.000	24.7
80.0	310.9	72.1	1.000	7.78	6.000	24.3
90.0 *	313.7	69.3	1.000	7.78	6.000	23.9
100.0	313.9	69.1	1.000	7.78	6.000	23.9
110.0	312.5	70.5	1.000	7.78	6.000	24.1
120.0	309.6	73.4	1.000	7.78	6.000	24.5
130.0	301.4	81.6	0.880	6.67	4.646	24.3
135.0 *	298.1	84.9	0.790	5.73	3.745	23.6
140.0	294.5	88.5	0.710	4.81	3.025	22.9
150.0	284.9	98.1	0.570	2.90	1.949	21.7
160.0	269.0	114.0	0.460	1.04	1.270	21.1
170.0	253.0	130.0	0.370	-0.85	0.821	20.2
180.0 *	250.0	133.0	0.340	-1.59	0.694	19.6
185.0	246.6	136.4	0.330	-1.85	0.653	19.5
190.0	249.0	134.0	0.340	-1.59	0.694	19.6
200.0	264.0	119.0	0.420	0.25	1.058	20.6
210.0	268.4	114.6	0.520	2.10	1.622	22.4
220.0	264.1	118.9	0.650	4.04	2.535	25.2
225.0 *	263.4	119.6	0.720	4.93	3.110	26.5
230.0	263.5	119.5	0.800	5.84	3.840	27.7
240.0	267.3	115.7	1.000	7.78	6.000	30.2
250.0	269.9	113.1	1.000	7.78	6.000	29.9
260.0	271.8	111.2	1.000	7.78	6.000	29.7
270.0 *	271.8	111.2	1.000	7.78	6.000	29.7
280.0	271.6	111.4	1.000	7.78	6.000	29.7
290.0	271.1	111.9	1.000	7.78	6.000	29.8
300.0	272.6	110.4	1.000	7.78	6.000	29.6
310.0	277.6	105.4	0.980	7.61	5.762	28.7
315.0 *	277.8	105.2	0.880	6.67	4.646	27.4
320.0	277.7	105.3	0.790	5.73	3.745	26.1
325.0	278.3	104.7	0.707	4.77	2.999	24.7
330.0	277.8	105.2	0.707	4.77	2.999	24.8
340.0	274.7	108.3	0.707	4.77	2.999	25.1
350.0	276.5	106.5	0.707	4.77	2.999	24.9

AVERAGE(*) = 282.6 meters

TABLE 2.3(a)

PREDICTED PROPOSED
60 dBu 50% CONTOUR

David A. Ringer
Westerville, OH

PROPOSED
54.0 dBu CONTOUR
(FM(50,10) Curves Utilized)

BEARING (Degrees)	AVERAGE TERRAIN (meters)	ANTENNA HAAT (meters)	----- HORIZONTAL -----			DISTANCE TO CONTOUR (km)
			RELATIVE	FIELD (dBk)	ERP (kW)	
0.0 *	285.3	97.7	0.707	4.77	2.999	36.2
5.0	286.2	96.8	0.707	4.77	2.999	36.0
10.0	288.1	94.9	0.790	5.73	3.745	37.8
20.0	287.5	95.5	0.990	7.69	5.881	42.6
30.0	291.9	91.1	1.000	7.78	6.000	41.8
40.0	297.6	85.4	1.000	7.78	6.000	40.5
45.0 *	300.8	82.2	1.000	7.78	6.000	39.7
50.0	303.9	79.1	1.000	7.78	6.000	38.9
60.0	306.3	76.7	1.000	7.78	6.000	38.3
70.0	308.0	75.0	1.000	7.78	6.000	37.9
80.0	310.9	72.1	1.000	7.78	6.000	37.1
90.0 *	313.7	69.3	1.000	7.78	6.000	36.3
100.0	313.9	69.1	1.000	7.78	6.000	36.3
110.0	312.5	70.5	1.000	7.78	6.000	36.7
120.0	309.6	73.4	1.000	7.78	6.000	37.4
130.0	301.4	81.6	0.880	6.67	4.646	36.9
135.0 *	298.1	84.9	0.790	5.73	3.745	35.6
140.0	294.5	88.5	0.710	4.81	3.025	34.3
150.0	284.9	98.1	0.570	2.90	1.949	32.2
160.0	269.0	114.0	0.460	1.04	1.270	31.2
170.0	253.0	130.0	0.370	-0.85	0.821	29.7
180.0 *	250.0	133.0	0.340	-1.59	0.694	28.8
185.0	246.6	136.4	0.330	-1.85	0.653	28.7
190.0	249.0	134.0	0.340	-1.59	0.694	28.9
200.0	264.0	119.0	0.420	0.25	1.058	30.4
210.0	268.4	114.6	0.520	2.10	1.622	33.4
220.0	264.1	118.9	0.650	4.04	2.535	38.2
225.0 *	263.4	119.6	0.720	4.93	3.110	40.3
230.0	263.5	119.5	0.800	5.84	3.840	42.4
240.0	267.3	115.7	1.000	7.78	6.000	46.5
250.0	269.9	113.1	1.000	7.78	6.000	46.1
260.0	271.8	111.2	1.000	7.78	6.000	45.8
270.0 *	271.8	111.2	1.000	7.78	6.000	45.8
280.0	271.6	111.4	1.000	7.78	6.000	45.9
290.0	271.1	111.9	1.000	7.78	6.000	45.9
300.0	272.6	110.4	1.000	7.78	6.000	45.7
310.0	277.6	105.4	0.980	7.61	5.762	44.4
315.0 *	277.8	105.2	0.880	6.67	4.646	42.0
320.0	277.7	105.3	0.790	5.73	3.745	39.8
325.0	278.3	104.7	0.707	4.77	2.999	37.5
330.0	277.8	105.2	0.707	4.77	2.999	37.6
340.0	274.7	108.3	0.707	4.77	2.999	38.1
350.0	276.5	106.5	0.707	4.77	2.999	37.8

AVERAGE(*) = 282.6 meters

TABLE 2.3(b)

PREDICTED PROPOSED
54 dBu 10% CONTOUR

David A. Ringer
Westerville, OH

PROPOSED
48.0 dBu CONTOUR
(FM(50, 10) Curves Utilized)

BEARING (Degrees)	AVERAGE TERRAIN ELEVATION (meters)	ANTENNA HAAT (meters)	----- HORIZONTAL -----			DISTANCE TO CONTOUR (km)
			RELATIVE	FIELD (dBk)	ERP (kW)	
0.0 *	285.3	97.7	0.707	4.77	2.999	51.1
5.0	286.2	96.8	0.707	4.77	2.999	50.9
10.0	288.1	94.9	0.790	5.73	3.745	53.1
20.0	287.5	95.5	0.990	7.69	5.881	58.5
30.0	291.9	91.1	1.000	7.78	6.000	57.9
40.0	297.6	85.4	1.000	7.78	6.000	56.7
45.0 *	300.8	82.2	1.000	7.78	6.000	56.0
50.0	303.9	79.1	1.000	7.78	6.000	55.3
60.0	306.3	76.7	1.000	7.78	6.000	54.7
70.0	308.0	75.0	1.000	7.78	6.000	54.3
80.0	310.9	72.1	1.000	7.78	6.000	53.6
90.0 *	313.7	69.3	1.000	7.78	6.000	52.8
100.0	313.9	69.1	1.000	7.78	6.000	52.8
110.0	312.5	70.5	1.000	7.78	6.000	53.2
120.0	309.6	73.4	1.000	7.78	6.000	53.9
130.0	301.4	81.6	0.880	6.67	4.646	52.8
135.0 *	298.1	84.9	0.790	5.73	3.745	50.9
140.0	294.5	88.5	0.710	4.81	3.025	49.2
150.0	284.9	98.1	0.570	2.90	1.949	46.2
160.0	269.0	114.0	0.460	1.04	1.270	44.4
170.0	253.0	130.0	0.370	-0.85	0.821	42.2
180.0 *	250.0	133.0	0.340	-1.59	0.694	40.9
185.0	246.6	136.4	0.330	-1.85	0.653	40.7
190.0	249.0	134.0	0.340	-1.59	0.694	41.0
200.0	264.0	119.0	0.420	0.25	1.058	43.3
210.0	268.4	114.6	0.520	2.10	1.622	47.2
220.0	264.1	118.9	0.650	4.04	2.535	52.8
225.0 *	263.4	119.6	0.720	4.93	3.110	55.2
230.0	263.5	119.5	0.800	5.84	3.840	57.6
240.0	267.3	115.7	1.000	7.78	6.000	62.4
250.0	269.9	113.1	1.000	7.78	6.000	61.9
260.0	271.8	111.2	1.000	7.78	6.000	61.6
270.0 *	271.8	111.2	1.000	7.78	6.000	61.6
280.0	271.6	111.4	1.000	7.78	6.000	61.6
290.0	271.1	111.9	1.000	7.78	6.000	61.7
300.0	272.6	110.4	1.000	7.78	6.000	61.5
310.0	277.6	105.4	0.980	7.61	5.762	60.1
315.0 *	277.8	105.2	0.880	6.67	4.646	57.5
320.0	277.7	105.3	0.790	5.73	3.745	55.0
325.0	278.3	104.7	0.707	4.77	2.999	52.4
330.0	277.8	105.2	0.707	4.77	2.999	52.5
340.0	274.7	108.3	0.707	4.77	2.999	53.0
350.0	276.5	106.5	0.707	4.77	2.999	52.7

AVERAGE(*) = 282.6 meters

TABLE 2.3(c)

PREDICTED PROPOSED
48 dBu 10% CONTOUR

David A. Ringer
Westerville, OH

FIG. 2.0

FM ALLOCATION STUDY

David A. Ringer
Westerville, OH

CARL E. SMITH CONSULTING ENGINEERS

2324 N. CLEVE-MASS RD., BOX 807
BATH, OHIO 44210-0807
216/659-4440

MAP BASE:
U.S. GEOLOGICAL SURVEY
1:1,000,000 SERIES
WORLD AERONAUTICAL CHART
LAKE ERIE (309)
KANAWHA RIVER (358)

WTTF-FM
279B

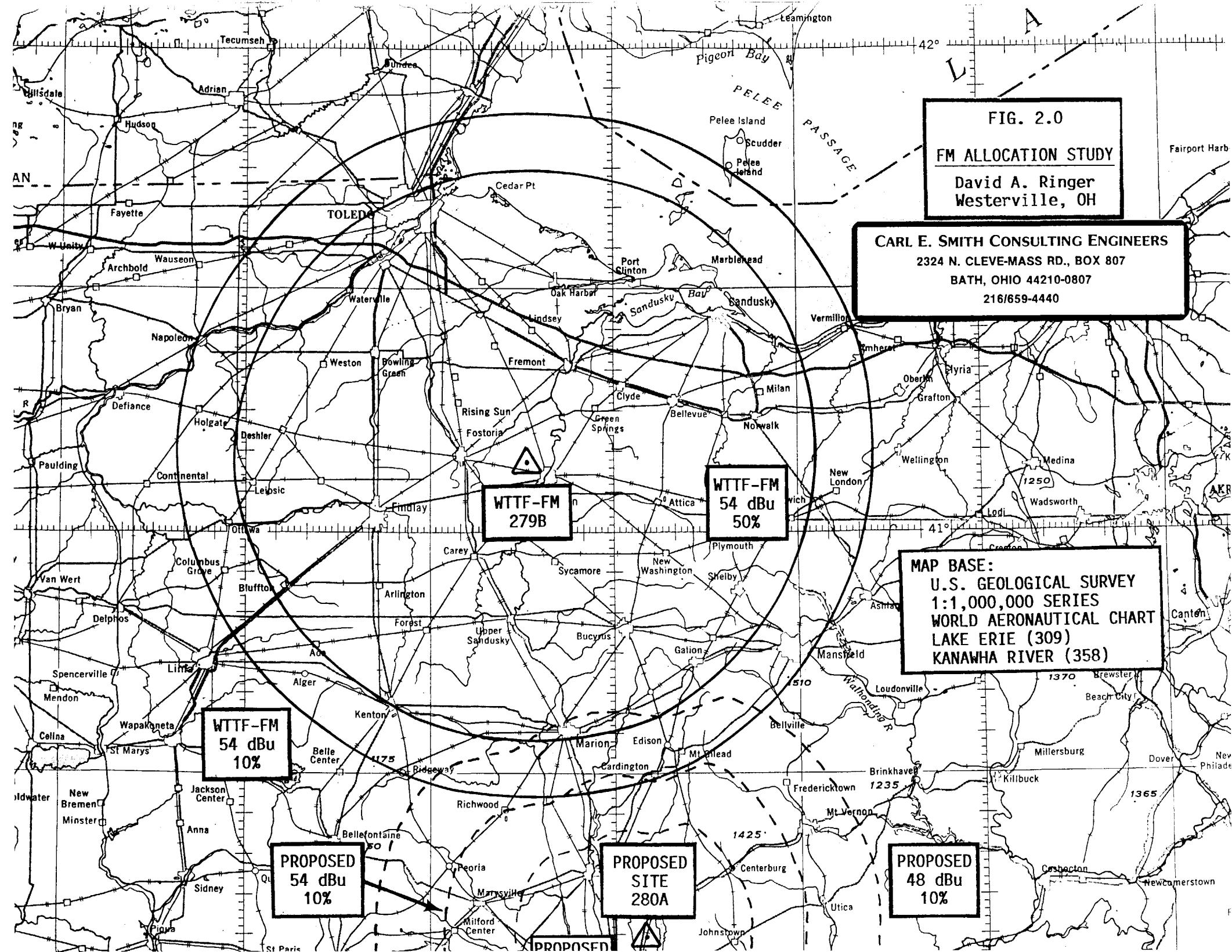
WTTF-FM
54 dBu
50%

WTTF-FM
54 dBu
10%

PROPOSED
54 dBu
10%

PROPOSED
SITE
280A

PROPOSED
48 dBu
10%



84°

40°

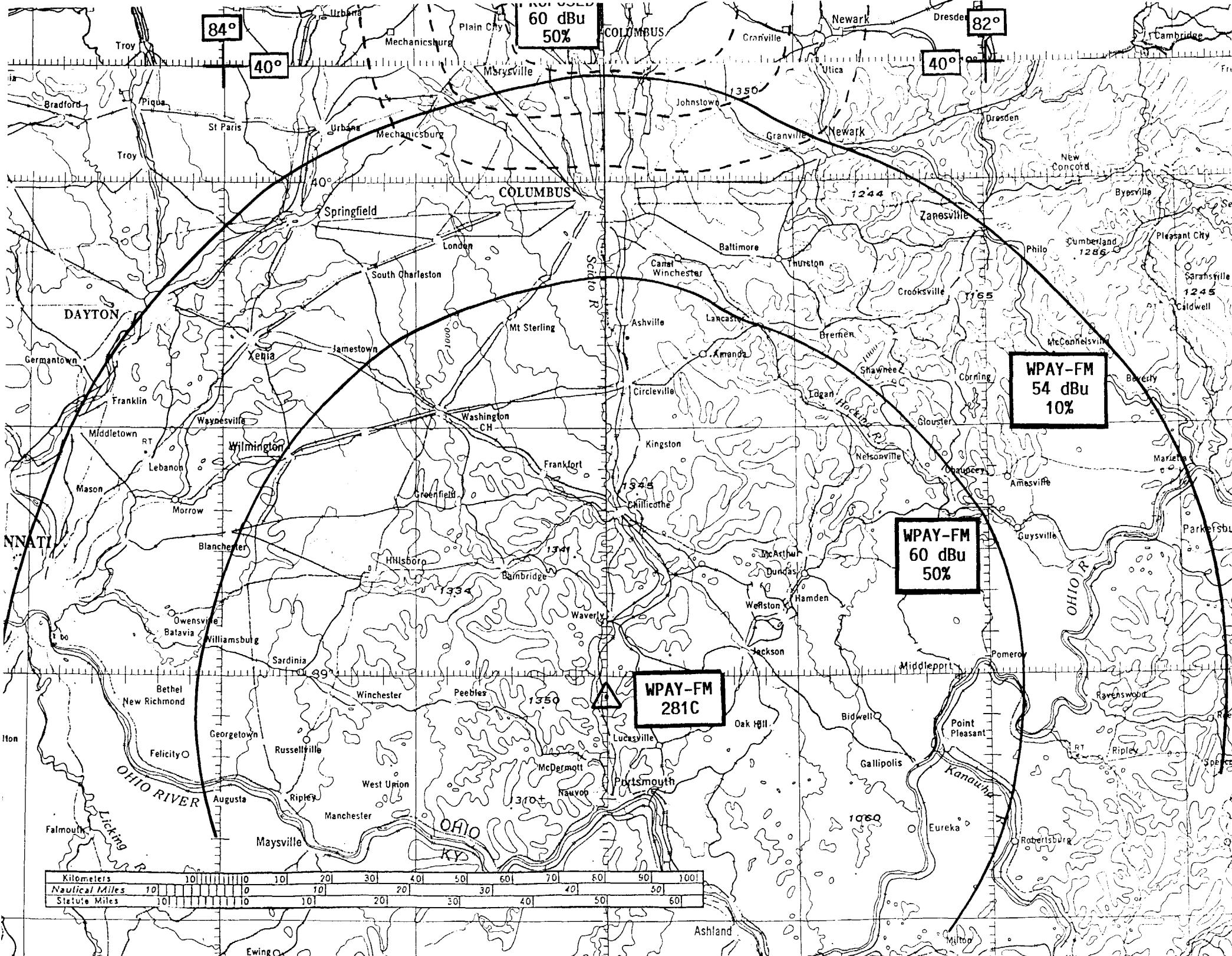
60 dBu
50%

82°

40°

WPAY-FM
54 dBu
10%WPAY-FM
60 dBu
50%WPAY-FM
281C

Kilometers	10	10	10	20	30	40	50	60	70	80	90	100
Nautical Miles	10	10	10	20	30	40	50	60	70	80	90	100
Statute Miles	10	10	10	20	30	40	50	60	70	80	90	100



3.0 PROPOSED ANTENNA SYSTEM

The proposed antenna will be a Jampro JSCP-3 (DA) three bay circularly polarized directional antenna. This antenna will be mounted on the existing tower which supports the antennas for WTTE(TV) and WOSU-TV. Table 3.0 presents a tabulation of the proposed directional pattern. Figure 3.0 presents this same data in polar form. Finally, Table 3.1 and Figure 3.1 present the proposed vertical radiation pattern for this antenna. It should be noted that the directional pattern shown herein is a composite envelope, or idealized pattern. When final pattern modeling is conducted by the antenna manufacturer, both the horizontally and vertically polarized radiation patterns will be totally encompassed within this envelope. Following the completion of this pattern modeling, the antenna will be mounted on the tower in accordance with the manufacturer's instructions. No other antennas will be mounted within or in close proximity to the aperture of this antenna. Furthermore, there is no platform or other similar structure at the top of this tower which could possibly distort the directional pattern of this antenna. The maximum proposed effective radiated power in both the horizontal and vertical polarizations will be 6.0 kilowatts. The maximum pattern suppression does not exceed the 15 dB value permitted by Section 73.316 of the FCC Rules. Furthermore, the slope of this pattern does not exceed 2 dB/10 degrees at any point on the pattern.

Figure 3.2 is a vertical plan view of the proposed installation.

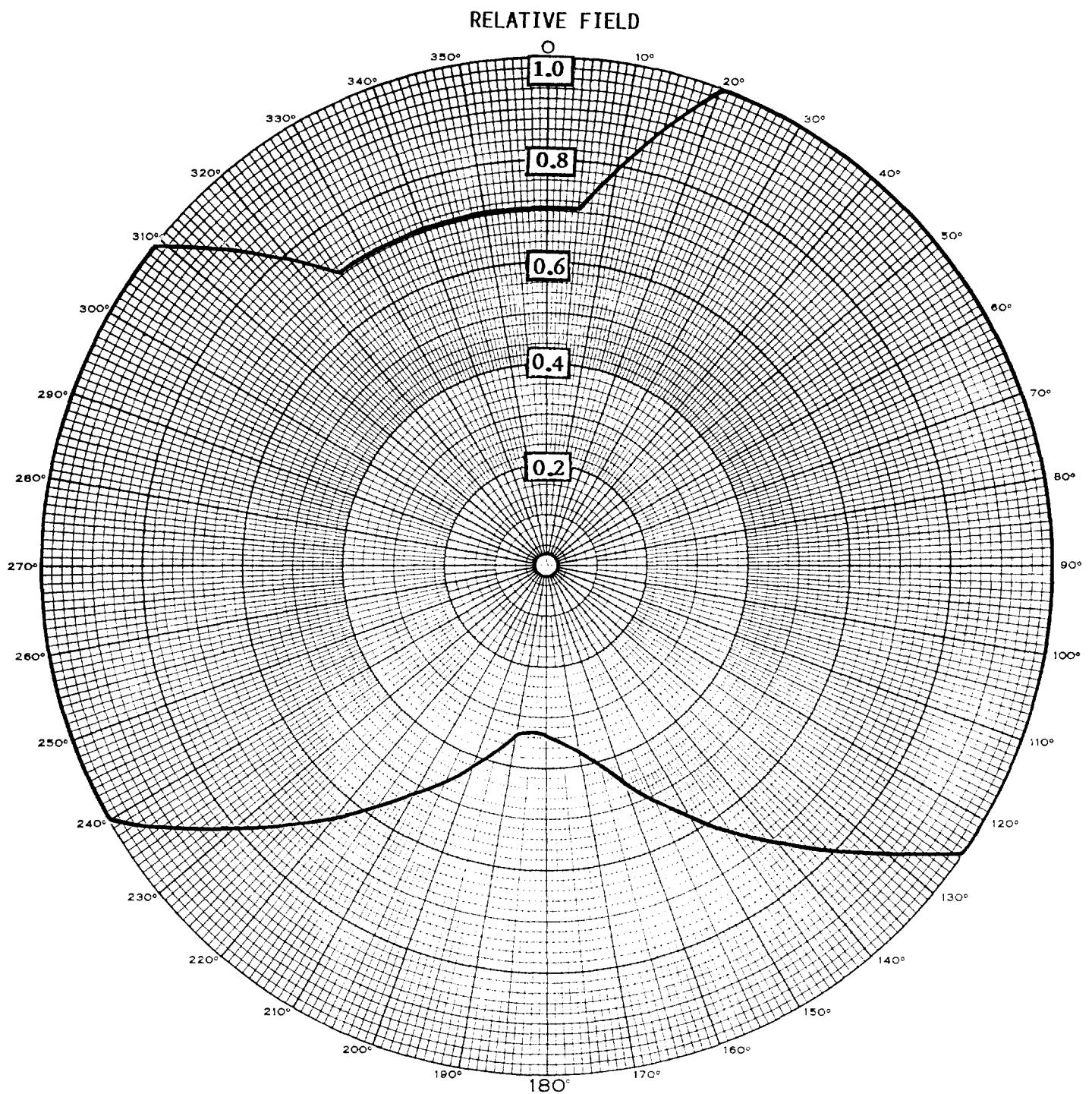
TABLE 3.0
PROPOSED DIRECTIONAL PATTERN

David A. Ringer
Westerville, OH

<u>Azimuth (Degrees)</u>	<u>Relative Field</u>	<u>dBk</u>	<u>ERP</u>	<u>kW</u>
0	0.707	4.77		3.00
5	0.707	4.77		3.00
10	0.790	5.73		3.75
20	0.990	7.69		5.88
30	1.000	7.78		6.00
40	1.000	7.78		6.00
45	1.000	7.78		6.00
50	1.000	7.78		6.00
60	1.000	7.78		6.00
70	1.000	7.78		6.00
80	1.000	7.78		6.00
90	1.000	7.78		6.00
100	1.000	7.78		6.00
110	1.000	7.78		6.00
120	1.000	7.78		6.00
130	0.880	6.67		4.65
135	0.790	5.73		3.75
140	0.710	4.81		3.03
150	0.570	2.90		1.95
160	0.460	1.04		1.27
170	0.370	-0.85		0.82
180	0.340	-1.59		0.69

TABLE 3.0 cont'd

<u>Azimuth (Degrees)</u>	<u>Relative Field</u>	<u>dBk</u>	<u>ERP</u>	<u>kW</u>
185	0.330	-1.85		0.65
190	0.340	-1.59		0.69
200	0.420	0.25		1.06
210	0.520	2.10		1.62
220	0.650	4.04		2.54
225	0.720	4.93		3.11
230	0.800	5.84		3.84
240	1.000	7.78		6.00
250	1.000	7.78		6.00
260	1.000	7.78		6.00
270	1.000	7.78		6.00
280	1.000	7.78		6.00
290	1.000	7.78		6.00
300	1.000	7.78		6.00
310	0.980	7.61		5.76
315	0.880	6.67		4.65
320	0.790	5.73		3.75
325	0.707	4.77		3.00
330	0.707	4.77		3.00
340	0.707	4.77		3.00
350	0.707	4.77		3.00



MAXIMUM ERP = 6.0 kW

FIG. 3.0
PROPOSED DIRECTIONAL
PATTERN
 David A. Ringer
 Westerville, OH

CARL E. SMITH CONSULTING ENGINEERS
 2324 N. CLEVE-MASS RD., BOX 807
 BATH, OHIO 44210-0807
 216/659-4440

TABLE OF FIELD STRENGTH

3-BAY

ELEV.	FIELD								
ANGLE	STRNGTH								
90.0	.100	89.0	.108	88.0	.116	87.0	.123	86.0	.131
85.0	.139	84.0	.147	83.0	.154	82.0	.162	81.0	.170
80.0	.177	79.0	.191	78.0	.204	77.0	.218	76.0	.231
75.0	.243	74.0	.256	73.0	.268	72.0	.280	71.0	.291
70.0	.301	69.0	.310	68.0	.319	67.0	.326	66.0	.333
65.0	.339	64.0	.343	63.0	.346	62.0	.348	61.0	.349
60.0	.347	59.0	.346	58.0	.342	57.0	.337	56.0	.330
55.0	.320	54.0	.308	53.0	.294	52.0	.278	51.0	.259
50.0	.239	49.0	.214	48.0	.188	47.0	.161	46.0	.132
45.0	.102	44.0	.070	43.0	.038	42.0	.006	41.0	.026
40.0	.058	39.0	.090	38.0	.121	37.0	.151	36.0	.179
35.0	.204	34.0	.227	33.0	.246	32.0	.262	31.0	.274
30.0	.281	29.0	.280	28.0	.275	27.0	.264	26.0	.247
25.0	.225	24.0	.196	23.0	.162	22.0	.123	21.0	.078
20.0	.028	19.0	.026	18.0	.085	17.0	.147	16.0	.212
15.0	.280	14.0	.349	13.0	.419	12.0	.489	11.0	.559
10.0	.626	9.0	.689	8.0	.747	7.0	.801	6.0	.850
5.0	.892	4.0	.929	3.0	.958	2.0	.980	1.0	.994
0.0	1.000	-1.0	.994	-2.0	.980	-3.0	.958	-4.0	.929
-5.0	.892	-6.0	.850	-7.0	.801	-8.0	.747	-9.0	.689
-10.0	.626	-11.0	.559	-12.0	.489	-13.0	.419	-14.0	.349
-15.0	.280	-16.0	.212	-17.0	.147	-18.0	.085	-19.0	.026
-20.0	.028	-21.0	.078	-22.0	.123	-23.0	.162	-24.0	.196
-25.0	.225	-26.0	.247	-27.0	.264	-28.0	.275	-29.0	.280
-30.0	.281	-31.0	.274	-32.0	.262	-33.0	.246	-34.0	.227
-35.0	.204	-36.0	.179	-37.0	.151	-38.0	.121	-39.0	.090
-40.0	.058	-41.0	.026	-42.0	.006	-43.0	.038	-44.0	.070
-45.0	.102	-46.0	.132	-47.0	.161	-48.0	.188	-49.0	.214
-50.0	.239	-51.0	.259	-52.0	.278	-53.0	.294	-54.0	.309
-55.0	.320	-56.0	.330	-57.0	.337	-58.0	.342	-59.0	.346
-60.0	.347	-61.0	.349	-62.0	.348	-63.0	.346	-64.0	.343
-65.0	.339	-66.0	.333	-67.0	.326	-68.0	.319	-69.0	.310
-70.0	.301	-71.0	.291	-72.0	.280	-73.0	.268	-74.0	.256
-75.0	.243	-76.0	.231	-77.0	.218	-78.0	.204	-79.0	.191
-80.0	.177	-81.0	.170	-82.0	.162	-83.0	.154	-84.0	.147
-85.0	.139	-86.0	.131	-87.0	.123	-88.0	.116	-89.0	.108
-90.0	.100								



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TABLE 3.1
VERTICAL RADIATION PATTERN

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Westerville, OH